

**Remarks**

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 6, 10, 14 and 15 are pending in the application, each of which is an independent claim. Claims 6 and 10 are amended to more clearly define that which Applicants claim as their invention. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

**I. Rejection under 35 U.S.C. § 112**

Claims 6 and 10 were rejected under 35 U.S.C. § 112, first paragraph, because the specification allegedly does not provide enablement for a method that recovers about 6000 mg/kg of cadmium and about 30,000 mg/kg of zinc with said *Thlaspi caerulescens* of the genotype G15. See Office Action page 2, line 8, through page 4, line 9.

Applicants respectfully traverse the rejection.

In furtherance of prosecution, and not in acquiescence to the rejection, Applicants have amended claim 1. One of ordinary skill in the art understands that phytoextraction from soils can be affected by the soil chemistry. The accumulating ability of any genotype of *T. caerulescens*, therefore, can be enhanced by changing the amount of that metal in the soil, soil pH and the presence of other minerals and salts.

In one example, the genotype *T. caerulescens* G15 accumulated about 1800 mg/kg of cadmium and about 18,000 mg/kg of zinc in the shoots based on dry weight. See page 9, lines 10-12 of the Application as filed. Applicants have also demonstrated

that soil chemistry can enhance the metal accumulation by *T. caerulescens* plants. See pages 10-12 of the application as filed. In particular, Table 1, on page 11 of the Application shows that changing the level of sulfur and nitrogen-containing fertilizers in the soil, and the soil pH, can enhance cadmium and zinc uptake in *T. caerulescens* by more than 40%.

One of ordinary skill in the art, after reading these examples, would understand that changing the soil chemistry would enhance the uptake of cadmium and zinc by *T. caerulescens* G15. The specification provides adequate teaching to demonstrate how soil chemistry can enhance G15's uptake from the exemplified 1800 mg/kg of cadmium and 18,000 mg/kg of zinc in the shoots based on dry weight, to 2600 mg/kg of cadmium and 26,000 mg/kg of zinc in the shoots based on dry weight.

The teachings of the specification fully enable one of ordinary skill in the art to practice the invention as claimed in claim 6 and 10. Applicants believe claims 6 and 10 are patentable and request that the rejection to these claims be withdrawn.

## ***II. Rejection under 35 U.S.C. §§ 102 and 103***

Claims 6, 10, 14 and 15 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Brown *et al.* (*Journal of Environmental Quality* 23:1151-1157 (1994)). See Office Action, page 4, line 10, through page 5, line 7. Applicants respectfully traverse the rejection.

It is the Examiner's assertion that the plants used by Brown *et al.* and the plants of the present invention are the same. See Office Action, page 5, lines 4-5. Applicants respectfully disagree.

Different *Thlaspi caerulescens* genotypes are classified in a number of ways. In the art, the plants are often classified by the region of the world in which the seeds were harvested. In Brown, for example, seeds of the *T. caerulescens* plants studied were harvested near Prayon, Belgium. See Brown, page 1152, 1<sup>st</sup> column, lines 27-29. And so, the plants are recognized in the art as "Prayon" genotype.

Seeds of other genotypes of *T. caerulescens* have been harvested in a variety of different regions, including regions in Southern France. In one example, seeds of *T. caerulescens* were harvested near St. Felix, France. The art, therefore, has recognized this genotypes of *T. caerulescens* as "Southern France" genotype.

In the present Application, Applicants collected seeds from a variety of regions and tested their ability to accumulate cadmium and zinc. Using the screening assay described on pages 8 and 9 of the specification, Applicants tested the ability of different genotypes to accumulate these metals. In the study, the different genotypes were named by number, instead of region, for example, *G1*, *G2*, . . . *G15*, . . . *G18* and so on. The seeds, and plants, described as *G15* and *G18* are distinct genotypes, and are also known in the art as "Southern France" type and "Prayon" type *T. caerulescens*, respectively. In the side-by-side study, *G15* and *G18* showed dramatic differences in accumulating ability, thus demonstrating the difference in genotype. See page 9, lines 9-12 of the specification and Figs. 1 and 2.

The art also recognizes the difference between *G15* and *G18* genotypes ("Southern France" and "Prayon" genotypes). For example, in Chaney, R., *et al.*, "Using Hyperaccumulator Plants to Phytoextract Soil Ni and Cd," *Z. Naturforsch.*, 60c:190-198 (2005), "Southern France" genotypes are distinguished from "Prayon" genotypes. A

copy of this reference is attached as Appendix A. In particular, Table II and Fig. 2 demonstrate the side-by-side comparisons of the two genotypes.

The numbering system in the present application and in Chaney, *et al.* are arbitrary. The difference in numbering for the "Prayon" genotype between the present application, which refers to it as *G18*, and Chaney, *et al.*, which refers to it as *G17*, does not represent a difference between the plants. The "Prayon" geneotypes of Chaney, *et al.* and the present application are the same.

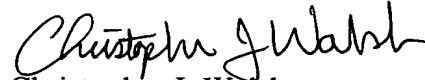
Applicants submit that both the specification and the art teach how "Prayon" *T. caerulea* used in Brown are distinguished from the *T. caerulea* *G15* ("Southern France" type) claimed in the present invention. Because the two plants are distinct, and Brown only teaches "Prayon" *T. caerulea*, Brown does not anticipate claims 6, 10, 14 and 15. Applicants believe claims 6, 10, 14 and 15 are patentable over Brown, and request that the rejection to these claims be withdrawn.

### ***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,  
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